

Chapter 5

accident reconstructionist	Person with knowledge of both crime scene investigations and the mathematics that can help to explain the circumstances surrounding the accident.
actuary	A statistician who predicts how many customers will submit claims based on criteria such as age, sex, marital status, driving record, and residence.
anti-lock braking system (ABS)	A system which most cars have that does not allow the wheels to continuously lock; in cars equipped with this feature, the driver feels a pulsing vibration on the brake pedal and that pedal moves up and down; the skid marks left by a car with ABS look like uniform dashed lines on the pavement.
appreciate	Increase in value over time.
arithmetic average	The same as the mean; the sum of all the numbers in a data set divided by the number of elements in the data set.
ascending order	Numbers that are in order from the least value to the greatest value.
automobile insurance	A contract between a driver and an insurance company, where the driver agrees to pay a fee (called the premium) and the company agrees to cover certain accident-related costs when the driver makes a claim (request).
bimodal	A set of data that has two modes.
bodily injury liability (BI)	Covers bodily injury if a driver is at fault in an accident.
box-and-whisker plot	Also called a boxplot; a type of graph that shows all four quartiles and the least number; it is drawn to scale.
boxplot	Also called a box-and-whisker plot; a type of graph that shows all four quartiles and the least number; it should be drawn to scale.
braking distance	The distance a car travels while braking to a complete stop.
braking efficiency	A number determined by an examination of the rear and front wheel brakes; it can run from 0% efficiency

(no brakes at all) to 100% efficiency (brakes are in excellent condition); the braking efficiency number is expressed as a decimal when used in the skid speed formula.

car-rental insurance	A type of insurance that pays for part of the cost of a rented car if a car is disabled because of a collision or comprehensive-covered repair.
chord	A line segment that connects two points on a circle.
claim	A request for payment by a driver involved in an accident to an insurance company that provides automobile insurance for the driver.
collision insurance	A type of insurance that pays for the repair or replacement of an insured car if its damaged in a collision with another vehicle or object, or if it overturns, no matter who is at fault. This type of insurance is usually required if there is a loan on the car.
comprehensive insurance	A type of insurance that covers the repair or replacement of parts of an insured car damaged by vandalism, fire, flood, wind, earthquakes, missiles, falling objects, riots, tree sprays, and other disasters; it also covers if the car is stolen.
currency exchange rate	A rate used to convert one country's currency to another country's currency.
cusps	On a graph, where two lines of a piecewise function meet.
data	A set of numbers.
deductible	Part of the repair or damages that a driver has to pay before the insurance company pays.
depreciate	Decrease in value over time.
descending order	Numbers that are in order from the greatest to the least.
distance formula	A formula for the distance a car travels that is a function of the rate and time that it travels, or $d = rt$.
dollar value	Value of money that something is worth, depreciates, or appreciates.
domain	The set of all first elements, (x-values) of ordered

	pairs.
drag factor	The pull of the road on the tires; it is a number that represents the amount of friction that the road surface contributes when driving.
electronic odometer	An odometer which gives the distance readings digitally.
emergency road service insurance	A type of insurance coverage that pays for towing or road service when a car is disabled.
English Standard System	System of measurement used in the United States.
exponential decay	Rather than the value decreasing by the same dollar amount each year, it decreases by the same percentage each year.
exponential depreciation	The model of exponential decay in the context of auto devaluation.
frequency	The number of times a particular piece of data appears in a set.
frequency distribution	A table or chart that gives each piece of data in the set and the frequency, or the number of times that it appears in the data set.
fuel economy measurement	How much gasoline a car uses to travel a certain distance.
historical data	The prices from the past that a car was worth.
historical depreciation	The devaluation of a car using historical data.
interquartile range (IQR)	The difference between the upper and lower quartiles; found by subtracting $Q3 - Q1$.
kilometers per liter (km/L)	A type of fuel economy measurement, which uses the metric system.
liability insurance	A type of insurance that covers a person from damages; most states set minimum liability requirements.
liable	Responsible for damages caused.
lower quartile	$Q1$ is the first quartile or lower quartile, and 25% of the numbers in the data set are at or below $Q1$.
mean	Often referred to as average; the sum of all the numbers in a data set divided by the number of

	elements in the data set.
measures of central tendency	Single numbers, such as the mean, median, and mode, designed to represent a "typical" value for the data.
mechanical odometer	An odometer that consists of a set of cylinders that turn to indicate the distance traveled.
median	The middle number when numbers are in ascending or descending order.
Metric System	System of measurement used in other countries outside of the United States.
middle ordinate	A segment drawn from the center of a chord to the arc of a yaw mark; this perpendicular segment is used to find the radius of a circle.
miles per gallon (mpg)	A type of fuel economy measurement, which uses the English Standard System.
mode	The most often occurring value in a data set; there can be more than one mode or no modes at all.
modified boxplot	A special type of boxplot that shows all the numbers that are outliers as single points past the whiskers.
negligent	At fault for damages caused.
no-fault insurance	Same as PIP or personal injury protection.
odometer	A gauge on the dashboard of a car that indicates the distance the car has traveled since it left the factory.
outlier	Numbers in a data set that are extreme values; calculate outliers in a data set by multiplying 1.5 times the IQR; subtract this product from Q1 to compute the boundary for lower outliers and add this value to Q3 to compute the boundary for upper outliers.
personal injury protection (PIP)	An added type of insurance coverage, mandatory in some states, that pays for any physical injuries of the driver or the passengers sustain while in the vehicle, even if there is no traffic accident; sometimes called no-fault insurance.
piecewise function	Also called a split function; it gives a set of rules for each domain of the function; $c(x)$ is computed differently depending on the value of x .

premium	The amount paid for an insurance policy.
property damage liability (PD)	Insurance coverage that pays for damage a driver causes to another person's property.
quartiles	Three values represented by Q1, Q2, and Q3 that divide the distribution into four subsets that each contains 25% of the data.
range	A value that tells how dispersed or spread out a data set is.
reaction distance	The distance a car travels during a reaction or thinking time.
reaction time	The time that the average, alert driver takes to switch from the gas pedal to the brake pedal; usually from approximately 0.75 second to 1.5 seconds.
resistant	When a value or measure of central tendency does not change easily or significantly due to an extreme value.
sales tax	A percentage paid to the government of sales on products or services.
shadow skid mark	When a driver first applies the brakes and the skid mark is light.
skew	When the mean of a data set is not equal to the median.
skid distance	A function of the number and lengths of the skid marks left at the scene of an accident.
skid mark	A mark that a tire leaves on the road when it is in a locked mode, that is, when the tire is not turning, but the car is continuing to move.
skid speed formula	he formula is $S = \sqrt{30Dfn}$, where S is the speed of the car when entering the skid, D is the skid distance, f is the drag factor, and n is the braking efficiency.
slope	The slope of the line is the numerical value for the inclination or declination of that line and is expressed as a ratio of the change in the vertical variable over the change in the horizontal variable from one point on the line to the next.
speedometer	A device that tells the rate at which the car is

	traveling.
split function	Also called a piecewise function; it gives a set of rules for each domain of the function; $c(x)$ is computed differently depending on the value of x .
statistics	Mathematics that deals with the collection, analysis, and interpretation of numerical facts or data.
stem-and-leaf plot	A type of graph or data display that shows frequency; the numbers to the left of the vertical line (stem) represent the tens place digit; the numbers to the right of the vertical line (leaf) represent the digits in the ones place, in ascending order.
straight line depreciation	A line that shows a constant decline in the value of something, something, such as a car that loses the same value each year.
straight line depreciation equation	The general form for the equation of a straight line is $y = mx + b$, where m represents the slope of the line and b represents the y -intercept.
subscripts	Small numbers, similar to exponents, except in the descending position that are used to name quartiles.
surcharge	An extra fee paid to an automobile insurance company for dividing an annual premium into monthly, quarterly, or semiannual payments.
thinking time	Same as reaction time.
total stopping distance	The sum of the reaction distance and the braking distance.
trip odometer	Another odometer that gives the accumulated distance traveled on a particular trip.
uninsured/underinsured motorist protection (UMP)	Coverage that pays for injuries to a driver or passengers caused by a driver who has no insurance or does not have enough insurance to cover the medical losses.
upper quartile	Q3 is the third quartile or upper quartile, and 75% of the numbers in the data set are at or below Q3.
yaw mark	Curved tire marks that indicate the vehicle was slipping sideways while at the same time continuing in a forward motion.